

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

F.R. KELLY & CO.  
Attn. Boyce, Concr  
27 Clyde Road  
Ballsbridge  
Dublin 4  
IRLANDE

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference P79726PC00	Date of mailing (day/month/year) 28/09/2007
International application No. PCT/EP2007/005330	International filing date (day/month/year) 18/06/2007
Applicant  FOTONATION VISION LIMITED	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.  
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

**4. Reminders**


Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

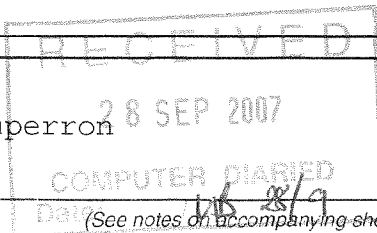
The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Nathalie Duperron
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P79726PC00	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2007/005330	International filing date (day/month/year) 18/06/2007	(Earliest) Priority Date (day/month/year) 11/08/2006
Applicant  FOTONATION VISION LIMITED		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 5  
☒ as suggested by the applicant  
☐ as selected by this Authority, because the applicant failed to suggest a figure  
☐ as selected by this Authority, because this figure better characterizes the invention  
b. ☐ none of the figures is to be published with the abstract

International application No  
PCT/EP2007/005330

According to International Patent Classification (IPC) or to both national classification and IPC

Minimum documentation searched (classification system followed by classification symbols)  
G06K H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 292 575 B1 (BORTOLUSSI JAY F [US] ET AL) 18 September 2001 (2001-09-18) abstract column 6, line 5 - column 7, line 42 column 9, line 14 - line 34 column 13, line 58 - column 15, line 65 figures 3,4a,7a-c,10,11 -----	1-18, 23-25
X	WO 01/33497 A (MICROSOFT CORP [US]) 10 May 2001 (2001-05-10) page 10, line 15 - page 12, line 28; figures 4,5 -----	1,15
X	EP 0 578 508 A2 (SONY CORP [JP]) 12 January 1994 (1994-01-12) the whole document -----	1,15

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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the international filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

\*& document member of the same patent family

Date of the actual completion of the international search

21 September 2007

Date of mailing of the international search report

28/09/2007

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Grigorescu, Cosmin

## INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/005330

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	NAYAK ET AL: "Automatic illumination correction for scene enhancement and object tracking" IMAGE AND VISION COMPUTING, GUILDFORD, GB, vol. 24, no. 9, September 2006 (2006-09), pages 949-959, XP005600656 ISSN: 0262-8856 abstract, Sections 4-6, Fig. 1-10, available on-line 30.06.2006 -----	1-25
A	US 5 715 325 A (BANG RICHARD D [US] ET AL) 3 February 1998 (1998-02-03) the whole document -----	1-25
A	US 2005/018923 A1 (MESSINA GIUSEPPE [IT] ET AL) 27 January 2005 (2005-01-27) the whole document -----	1-25
A	EP 1 398 733 A (GRETAG IMAGING TRADING AG [CH]) 17 March 2004 (2004-03-17) the whole document -----	1-25
A	US 2002/141640 A1 (KRAFT WALTER [CH]) 3 October 2002 (2002-10-03) the whole document -----	1-25

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/005330

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6292575	B1	18-09-2001	US 2002136448 A1	26-09-2002
WO 0133497	A	10-05-2001	AU 1353801 A	14-05-2001
			US 6792135 B1	14-09-2004
EP 0578508	A2	12-01-1994	DE 69326394 D1	21-10-1999
			DE 69326394 T2	23-03-2000
			JP 3298072 B2	02-07-2002
			JP 6030318 A	04-02-1994
			US 5430809 A	04-07-1995
US 5715325	A	03-02-1998	DE 19634768 A1	06-03-1997
US 2005018923	A1	27-01-2005	EP 1482724 A1	01-12-2004
			JP 2004357277 A	16-12-2004
EP 1398733	A	17-03-2004	CA 2435160 A1	12-03-2004
			US 2004052414 A1	18-03-2004
US 2002141640	A1	03-10-2002	CA 2371298 A1	09-08-2002
			EP 1231564 A1	14-08-2002
			JP 2002358513 A	13-12-2002

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

## PCT

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/EP2007/005330

International filing date (day/month/year)  
18.06.2007

Priority date (day/month/year)  
11.08.2006

International Patent Classification (IPC) or both national classification and IPC  
INV. G06K9/00

Applicant  
FOTONATION VISION LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
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Fax: +31 70 340 - 3016

Date of completion of  
this opinion

See form  
PCT/ISA/210

Authorized Officer

Grigorescu, Cosmin

Telephone No. +31 70 340-4889



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/EP2007/005330

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in electronic form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/EP2007/005330

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	<u>11-25</u>
	No: Claims	<u>1-10</u>
Inventive step (IS)	Yes: Claims	<u>19-22</u>
	No: Claims	<u>1-18,23-25</u>
Industrial applicability (IA)	Yes: Claims	<u>1-25</u>
	No: Claims	

2. Citations and explanations

see separate sheet

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet



### VIII. Clarity (Art. 6 PCT)

- 1.1 It is not immediately apparent which is the aim of the last step of "enhancing the contrast" of claim 1. With reference to the description, it would appear that the contrast enhancement is envisaged for facilitating the tracking in subsequent frames. Said observation applies equally to the corresponding apparatus claim 15, as well as to independent claims 16, 23, 24 and 25.
- 1.2 In claim 4, it is not immediately apparent what is denoted by "relaxed face detection parameters".
- 1.3 The feature referring to the "exposure parameters" of claim 7 is vague. It cannot be understood which entities are denoted by "parameters" (time? diaphragm of an optical device?).
- 1.4 The terms "restrictive skin filter" and "relaxed skin filter" of claim 13 do not bear a clear technical meaning (Art. 6 PCT).

### V. Novelty and inventive step (Art. 33(2) and (3) PCT)

Reference is made to the following document:

D1: **US-B1-6 292 575** (Bortolussi Jay F [US] et al) 18 September 2001 (2001-09-18)

### Claims 1-14

- 2 Claim 1 does not meet the requirements of Art. 33(2) PCT in that it is not novel over document D1. This document discloses its features as follows:

A method of detecting faces in an image stream using a digital image acquisition device (col. 9, l. 14-50, Fig. 3) comprising:

- a. receiving an acquired image from said image stream potentially including one or more face regions (idem);
- b. sub-sampling said acquired image at a specified resolution to provide a sub-sampled image (idem);
- c. identifying one or more regions of said acquired image predominantly including skin tones (col. 6, l. 39-col. 7, l. 42);
- d. calculating a corresponding integral image for at least one of said skin tone regions of said sub-sampled acquired image ("region of interest", col. 6, l. 5-56);
- e. applying face detection to at least a portion of said integral image to provide a set of one or

more candidate face regions each having a given size and a respective location (the detection performed in the "eigenface" space, col. 13, l. 21-56); and

f. for a candidate face region associated with a previous image in said stream, enhancing the contrast of the luminance characteristics of the corresponding region of said acquired image (tracking of the face described in col. 17, l. 49-col. 18, l. 15; the computation of correlation between successive frames, col. 17, l. 63-65 is based on the "eigentechnique" described in col. 13, l. 9-56 and involves contrast modification, col. 13, l. 57 - col.14, l. 7).

All the features of claim 1 are disclosed by D1, therefore claim 1 is not new (Art. 33(2) PCT). The same observation applies to the corresponding apparatus claim 15.

- 3.1 The features of the dependent claims 2, 3, 5 are not new (Art. 33(2) PCT), see the above identified passages of D1.
- 3.2 A concept substantially identical with the "relaxed detection parameters" of claim 4 is described by D1, col. 14, l. 26-col. 15, l. 65. Claim 4 is therefore not new (Art. 33(2) PCT).
- 3.3 The features of claim 6 are anticipated by the sequence described on D1, col. 17, l. 49 - col. 18, l. 15; said claim is therefore not new (Art. 33(2) PCT).
- 3.4 Considering that brightness is an "exposure parameter", claim 7 is anticipated by D1, col. 13, l. 57 - col.14, l.26 (Art. 33(2) PCT).
- 3.5 Claims 8 and 9 are anticipated by D1, col.14, l. 26 - col. 15, l. 65 (Art. 33(2) PCT).
- 3.6 Claims 10-12 concern features related to adaptation to various illumination conditions. Since automatic contrast adjustment by taking into account an image region is available in everyday digital cameras, said claims do not seem to involve an inventive step (Art. 33(3) PCT).
- 3.7 A concept substantially equivalent to the "relaxed skin filter" of claim 13 is described in connection with the various window functions, see D1, col. 14, l. 37 - col.15, l. 65. It is not immediately apparent which is the technical achieved by using two filters (a "restrictive filter" and a "relaxed filter", see also the clarity issue identified at 1.3 above). For this reason, it is considered that claims 13 and 14 lack inventive step (Art. 33(3) PCT).

#### **Claims 16-18,23-25**

- 4.1 Step (f) of claim 16 and, respectively, claim 23, is implicitly disclosed by D1 in the sequence of

steps described on col. 17, l. 49-col. 18, l. 7, taken in combination with col. 13, l. 21 - col. 15, l. 65. For this reason claim 16 is considered as not inventive (Art. 33(3) PCT).

4.2 As of claims 17-18, see 3.7 above.

4.3 With the clarity provision concerning the "relaxed skin filter" mentioned at 1.4 above, claims 24 and 25 discloses combinations discussed at 3.5 and 3.7 above. For this reason, said claims lack inventive step (Art. 33(3) PCT).

#### **Claims 19-22**

5 The subject-matter of these claims is neither taught nor suggested by the prior art retrieved during the search. The specificity in the number of images considered during the tracking seem to lead to a more stable detection of the face region. Said claims are therefore considered as new and seem to involve an inventive step.